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INTERCOLLEGIATE GEOLOGICAL EXCURSION OF NEW ENGLAND

The thirteenth annual Intercollegiate Geological Excursion of New England, on October 16, was directed by Professor Joseph Barrell of Yale University. The main purpose was to study the complicated physiography of western Connecticut, between Waterbury and Torrington, and for this reason the excursion had a prominent geographical as well as geological character of interest to a large circle of students.

With the recognition, a quarter of a century ago, of the importance of subaerial base-leveling and the mark of its approximate completion in the peneplain, southern New England came to be looked upon as a type illustration. The date of the completion of the peneplain was regarded as late Mesozoic, the time of first uplift as early in the Tertiary, and the dissection as due to Tertiary erosion.

In December, 1912, Professor Barrell gave two papers at the New Haven meeting of the Geological Society of America, which, in a number of the conclusions, were radically opposed to this older interpretation. Although the importance of peneplanation in continental interiors was not questioned, nor the quantitative dominance of river erosion even on the eastern side of the Appalachians, it was concluded from the evidence remaining that the so-called peneplain of southern New England was originally stairlike or terraced in its character, facing the sea, and bore the marks of ultimate control by marine denudation. These terraces are now dismantled by erosion except in regions favored by the presence of broadly developed resistant rock-structures.

Names have been given to these terraces, and the route of the excursion crossed the following in the region where they are recognizably preserved: Cornwall terrace, elevation 1680 to 1720 feet; Goshen terrace, elevation 1340 to 1380 feet; Litchfield terrace, elevation 1100 to 1140 feet; Prospect terrace, elevation 880 to 920 feet. Lower and younger base-levels were shown along the line of the excursion by the stream-eroded valley forms, though also represented by marine terraces farther toward the sea. The marine terraces and river valleys which were traversed are all regarded as younger than the Miocene.[1]

The evidences on which this new interpretation is based are drawn from a broad study of the country between Vermont and Virginia and were presented by Professor Barrell in an illustrated lecture Friday evening, October 16, in Peabody Museum, Yale University.

The topographic maps of the U. S. Geological Survey which cover the region traversed are the Waterbury, New Milford, Winsted, and Cornwall sheets, all of Connecticut. In order that the significant features may be more readily perceived it is desirable to emphasize certain contours of these maps with colored crayons or drawing inks, as follows: Waterbury sheet, 800, 1000, 1200 feet; New Milford sheet, 1000, 1200, 1400 feet; Winsted sheet, 1200, 1400, 1600 feet; Cornwall sheet, 1400, 1600, 1800 feet. Each of these contours, at least on the same map, should have a separate color.

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[1] For an abstract presenting this view of marine terraces see *Bull. Geol. Soc. Amer.*, Vol. 24, 1913, pp. 688-691, and the discussion on the pages following.

Stops for observation and discussion were made at strategic points every few miles. From the first point, elevation 590 feet, the subaerial valley forms below the Prospect terrace were noted. Here, as is generally true in any one view, nothing more than one older, outer, and higher, one younger, inner, and lower valley slope is demonstrable; yet a broader study of the region suggests that the valleys had been eroded here with respect to older base-levels of about 620 and 520 feet, and several younger and lower base-levels. It emphasized the need in physiographic study of an analytical investigation of a region from the map as a necessary accompaniment of local field observation.

The next stop was at an elevation of 900 feet on the top of a remnant of the Prospect terrace. Here again, as in most cases, nothing conclusive is shown by observation at one point in regard to the mode of origin of the Prospect terrace or its relation to the higher levels. A broader study suggests, however, that it was made by a marine planation of moderate amount resulting from a submergence following a long period of subaerial erosion.

The three higher terraces, on the other hand, as shown on the route through Morris, Litchfield, and West Goshen, show very definitely plains cut nearly horizontally, but at successively higher levels. From the viewpoint of each lower plain, the front of the next higher terrace is seen to trend as a dissected and sloping wall across the landscape. The surface of each higher terrace has suffered also to a greater extent than those lower from subsequent subaerial denudation.

The consequences following from this interpretation of the Piedmont plateau are most important, as it changes the conception of its mode of origin and of the Tertiary history of the Atlantic slopes. It gives a suggestion of the geological rapidity of completion of an erosion cycle in a region near the sea and of a sequence of diastrophic rhythms there recorded. A similar control of the topography of the seaward slopes should be applied as a working hypothesis as a competitor of the older explanation for other portions of the Atlantic shores.

THE SAND HILLS OF NEBRASKA[1]

About 20,000 square miles in central and western Nebraska, with smaller areas in neighboring states (mostly between 2000 and 3000 feet above sea-level) are characterized by sand-hills unlike those of any other part of the world. Professor Pool has now written a comprehensive account of this region. His monograph discusses the history of exploration of the area, its location and extent, geology and soils, topography and drainage, climate, effects of fire, soil moisture and texture, and plant ''formations'' and associations (this topic covering nearly 100 pages), and closes with a bibliography and thirty excellent half-tones.

The region is underlaid by Tertiary sandstones, the weathering of which has produced a soil consisting almost wholly of quartz sand on the uplands, with

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[1] A Study of the Vegetation of the Sand-hills of Nebraska. By Raymond J. Pool. Map, ills. *Geol. & Nat. Hist. Surv. of Minnesota Botanical Studies*, Vol. 4, Part 3, pp. 189–312. Univ. of Minnesota, Minneapolis, 1914. 9½ x 6½.